

1858. *Columba leuconota*. White-bellied or Snow Pigeon.

A small flock seen several times round our highest camp at 15,000 ft.

1928. *Lophophorus impejanus*. Monal Pheasant.

Common from 11,000 to 15,000 ft. both along the pilgrim trail and along the track to the Gunja La. Cocks and hens were always separate, usually in parties of 3 to 6 birds. A young female shot had yellow soles to the feet, whereas in the adult they were greenish-brown. In flight the female appears brown with much white on the tail.

1993. *Lerwa lerwa*. Snow Partridge.

Coveys seen at 16,000 ft. on the track to the Ganja La, and at 12,000 ft. above the pilgrim trail. Red bill and legs, chestnut breast, and closely barred black and buff upper-parts are diagnostic; the white bars near the tips of the inner secondaries show up in flight. Birds utter shrill whistles when alarmed.

THE STORM-PETRELS OCCURRING IN THE NORTHERN INDIAN OCEAN, AND ADJACENT SEAS.

By

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(*With a plate*)

Four species of storm petrel have been recorded at different times from the north portion of the Indian Ocean and its adjacent seas.¹ They are,

Wilson's Storm-Petrel, *Oceanites oceanicus* (Kuhl)

Black-bellied Storm-Petrel, *Fregatta tropica* (Gould)

British Storm-Petrel, *Hydrobates pelagicus* (Linn.)

Swinhoe's Storm-Petrel, *Oceanodroma monorhis* (Swinhoe)

The most plentiful and interesting of these is Wilson's Storm-Petrel, which occurs as a regular winter visitor from June to October. The other three would appear to be only very rare vagrants, and in the case of one at least the identification may be erroneous.

In the following notes an attempt is made to summarise what is known of the occurrence of these birds in our area, with the inclusion of some unpublished data. It must be stressed that records are still meagre, and further information, supported if possible by skins, would be welcome. For this reason a brief statement of the essential characteristics of each species, as seen on the wing, has been added at the end of the section dealing with it.

¹ I have decided, after careful consideration, not to include in this paper the records of W. W. A. Phillips (*Journal B.N.H.S.*, Vol. 46 pt. 4, pp. 593-613).

Oceanites oceanicus (Kuhl): Wilson's Storm-Petrel.

Wilson's Petrel breeds at a number of points on the coast of the Antarctic Continent and the adjacent islands, and on several islands in the Antarctic and Sub-Antarctic zones. In the sector south of the Indian Ocean it is known to nest in Enderby Land, Kaiser William II Land, Queen Mary Land and Kerguelen. It probably also breeds on Heard Island, but the point has not yet been confirmed. A record has been published of its supposed nesting on Mauritius (Bent, 1922, p. 172), but it must be considered erroneous. Birds seen in the Indian Ocean are most likely to be either *O. oceanicus exasperatus* Mathews, from the Antarctic Continent, or *O. oceanicus parvus* Falla, from the Kerguelen group.

Dr. Brian Roberts in a monograph on this petrel quotes all the information accessible to him on its oceanic migrations (Roberts, 1940, pp. 176-187). There are a large number of records from the Atlantic Ocean, from which it would appear that the majority of the adult birds breeding south of this area make a clockwise tour of the region from March to October, extending north as far as the latitude of Newfoundland and the British Isles. They normally reach the vicinity of the former in April, and leave the entrance to the English Channel by the end of September. There is considerably less information available with regard to the Indian and Pacific Oceans.

The data collected by Dr. Roberts for the Indian Ocean suggests that the bird is not present north of about 30° south latitude until after the end of April. More recently in this journal P.I.R. Maclaren has recorded Wilson's Petrel as sparsely distributed from Aden to a point 600 miles eastward about the middle of February, 1945 (Maclaren, 1946, p. 543). I saw a single bird some fifty miles north-east of Socotra in the same month in 1947: I was not in a position to keep a continuous watch, and there may have been more. Both these records are appreciably earlier than Dr. Roberts's data for this latitude. His information would suggest that the birds move northwards in the Indian Ocean rather later than in the Atlantic. These observations raise a different point. Birds seen in February can scarcely have finished breeding for the season, and still reached the Gulf of Aden so early in the year. It would suggest that a proportion of the non-breeding birds remain in this area, north of the equator, throughout the southern summer. This is an interesting possibility, but one would have felt that if it were so, there would have been other records for the period December to April. At present there are none.

There are several records from the southern Indian Ocean for May, but by the end of this month at least some birds are in the Arabian Sea. Captain Butler took a specimen, now in the British Museum, off the Mekran coast, between Charbar and Pusni, on 28th May, 1877, and saw others (Butler, 1877, p. 291). Captain Bishop, who was with him at the time, later met with it off the coast of Sind, between Karachi and the Indus, but unfortunately no date is given to this observation (Butler, 1878, p. 178).

A number of records show that Wilson's Petrel is plentiful in the area comprising the western portion of the Arabian Sea, the Gulf of Aden and the southern half of the Red Sea from June to September,

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1. Wilson's Storm-Petrel [*Oceanites oceanicus* (Kuhl)]
2. Black-bellied Storm-Petrel [*Fregatta tropica* (Gould)]
3. British Storm-Petrel [*Hydrobates pelagicus* (Linn.)]
4. Swinhoe's Storm-Petrel [*Oceanodroma monorhis* (Swinhoe)]

and apparently absent from the southern half of the Indian Ocean. In addition to the data summarised by Dr. Roberts, Maclaren (*ibid*) reports a few birds within 500 miles of Suez in June 1944, and huge numbers between about 240 and 270 miles east of Aden, and near the Straits of Bab-el-Mandeb, in the same month of 1946. H. G. Lumsden (1947, *in lit.*) saw occasional birds from 600 miles east of Aden to about half way up the Red Sea early in June, 1947. E. H. Bromley (1947, *in lit.*) observed Wilson's Petrels following in the wake of the ship in ones and twos, or up to about half a dozen, during the first part of a journey from Aden to Colombo, on 5th to 8th September, 1931. In 1945 I saw Wilson's Petrels continuously from the vicinity of Socotra to the neighbourhood of the Twelve Apostles, north of Perim, from 29th September to 2nd October. At times over forty were in sight at once. There can be no doubt of the identity of the bird as one landed in a life boat during the early morning of 2nd October, and was captured without difficulty.

According to Dr. Roberts, southward movement begins in October, but some birds still linger in the Arabian Sea until the end of the month. Bromley (*ibid*) saw several Wilson's Petrels in the Gulf of Aden on 9th October, 1946, and one near the entrance to Colombo harbour on 14th October. There are no certain records for the Indian Ocean proper north of latitude 40° south for November, except for a bird captured off Ceylon by Captain Fletcher in 1908 (Wait, 1925, p. 418), and it would seem that the main body of the migration has already passed below 50° south latitude. The Ceylon record is interesting. Various observers since Legge, who saw birds probably of this species on 19th August, 1874 (Legge, 1880, p. 1057), report birds off the Ceylonese coast, often without dates, but the only specimen that has been taken is Captain Fletcher's.

The general conclusion of these records, as Dr. Roberts points out, would be that the principal northerly goal of the migration across the Indian Ocean is in the extreme north-west. Probably the main mass of birds reaches the neighbourhood of Socotra and the Arabian coast in May and June, and moves south by way of the waters off Ceylon in September and November. There remains to be considered the extent to which they can be said to travel further east. There are no records from the northern part of the Bay of Bengal, but there are now several from the neighbourhood of the Malay Peninsula.

Davison saw birds which were probably of this species near the Moscos, off the coast of Tenasserim, north of Tavoy, in July (Hume and Davison, 1878, p. 490)¹. Robinson and Chasen (1936, p. 87) note that on several occasions small black petrels with white rumps had been seen in stormy weather in various parts of the Straits of Malacca, but they give no details of dates or localities. On 19th September, 1945, I saw a single bird in the neighbourhood of the Aroa Islands (Straits of Malacca, lat. 3° north, long. 100° 40' east). Bromley (1948) records three or four of these birds seen about midday on 12th December, 1938, while crossing from the Langkawi Islands to

¹. This information is also given in a note by Hume to Butler's paper (Butler, 1877, p. 292).

the Kedah mainland. On the whole one would suggest that these represent a small proportion of the total mass, rather than the main body of the movement. The Straits of Malacca are relatively narrow, and much frequented by shipping. If any large number of birds were passing down them annually one would expect to find more records. It would seem also that Bromley's birds were rather late for a southward movement towards the breeding grounds. They must either have been strays that were lost or, like the early records from the neighbourhood of the Arabian Sea, birds wintering north of the equator.

Several of the earlier observers, particularly Legge (1880, p. 1057), appear to have been unwilling to make positive identifications. Caution in these matters is very desirable, but there would seem to be little doubt that Wilson's Petrel is the only storm petrel with a white rump and dark underparts occurring regularly in the Indian Ocean proper. Identification can be further confirmed by the long legs, with yellow webs to the feet, which trail behind the tail in a conspicuous and characteristic manner in flight. Two of the three recorded rare vagrants, the British Storm-Petrel and the Black-bellied Storm-Petrel, also have white rumps, but their legs are entirely black and appreciably shorter, and they are smaller, with a weaker, more fluttering, bat-like flight. The Black-bellied Storm-Petrel also has prominent white areas on the flanks and sides of the abdomen, and the middle of the under surface of the wings. These points might be difficult to distinguish from the deck of a large ship, but my feeling is that they would not be. I had experience of both birds on a passage by a whale-catcher from Durban via Cape Town to South Georgia, and certainly from that low level there was no doubt of the white on the ventral surface of *Fregatta tropica*.

***Fregatta tropica* (Gould): Black-bellied Storm-Petrel.**

In the southern Indian Ocean this bird breeds on Kerguelen and the Crozet Islands. It may also nest on St. Paul and Amsterdam Islands, but these sites have never been confirmed. The Black-bellied Storm-Petrel is plentiful in parts of the southern oceans, particularly the South Atlantic, but it does not appear to make a regular crossing of the tropical zone. Sperling (1872, p. 75) writes of about thirty of these birds playing round the wake of his ship in latitude 5° south, longitude 30° west, but I know of only one record from the North Atlantic—the type specimen which was taken in latitude 6° 33' north, off the coast of Sierra Leone.

This species is included in the fauna of the northern Indian Ocean on the strength of a single specimen labelled 'Bay of Bengal' in the Marquis of Tweeddale's handwriting, which was in his collection when it was acquired by the British Museum. Blanford (1898, p. 355) accepts the locality, and since then this region has been included in its range (Stuart Baker, 1929, p. 302). There do not appear to be any reliable sight records from our area.

The interest of this bird here would seem to be largely that it has several times been considered when a white-rumped storm-petrel was seen. The plumage differences are given above, under Wilson's Petrel. In addition I would stress the very weak, fluttering

flight, which struck me most forcibly when I watched these birds in the South Atlantic.

Hydrobates pelagicus (Linn.): British Storm-Petrel.

The nearest breeding grounds of this bird are on certain of the islands in the western Mediterranean. Its occurrence within our area, even as a very rare vagrant, is doubtful. Von Heuglin (1873, quoted by Dr. Roberts, 1940, p. 186) records the presence of storm-petrels in the neighbourhood of Bab-el-Mandeb and the Gulf of Tajura, in the Red Sea, in September and October. He did not obtain any specimens, but thought that the birds belonged to this species. In view of the extent to which Wilson's Storm-Petrel is now known to occur in this area during these months, it would seem probable that his identification was erroneous, and that the Red Sea should be excised from the range of this bird until formal evidence is forthcoming.

The British Storm-Petrel, like Wilson's, has a white rump, but it is smaller, with an irregular, whitish patch on the middle of the undersurface of the wings and dark webs to its feet, which do not project beyond the tail in flight. The last two points are diagnostic. It also has more rounded wings and a much weaker, and more fluttering flight, not unlike that of the Black-bellied Storm-Petrel.

Oceanodroma monorhis (Swinhoe): Swinhoe's Storm-Petrel.

This is a Pacific species, with races breeding on both sides of the Ocean. The typical form, *O. m. monorhis* (Swinhoe) nests on islands off Formosa, ranging north to Japan and south to the southern end of the Straits of Malacca.

Swinhoe's Petrel would seem to be not uncommon in the neighbourhood of Horsburgh Lighthouse, 37½ miles east of Singapore, from September to May. The Raffles Museum collection contains specimens taken there in April, May, September, October and November. I visited Pedra Branca on 28th September, 1947. No petrels were seen in the vicinity of the lighthouse, but two, undoubtedly of this species, were observed about ten miles east of Singapore harbour, on the return journey. Robinson and Chasen (1936, p. 86) quote a visual record by C. Boden Kloss of a small flock seen inshore off Singapore Island in November, and a specimen was captured on a ship in the harbour in May, 1913.

This species occasionally travels at least a short distance northwards up the Straits of Malacca, and thus enters our area. There is a specimen in the Raffles Museum collection from the One Fathom Bank Lighthouse, between the Aroa Islands and the coast of Selangor, taken in November, 1918. It is possible that it sometimes strays further west, though there is only a single record, unsupported by a skin. H. M. Tomlinson (1924, p. 51) describes a petrel of a uniform dark chocolate colour which came aboard the ship on which he was travelling, late at night on 10th June 1923, when they were about fourteen hours west of Colombo. It was liberated after he had examined it, but he was of the opinion that he recognized the species immediately when he was shown specimens of Swinhoe's